DOCUMENT RESUME

ED 183 013 FL 010 984

AUTHOR Hutchinson, Tom: And Others
TITLE An English Language Curriculum for Technical Students. Practical Papers in English Education, Volume 2.
INSTITUTION Lancaster Univ. (England). Inst. for English Lanugage Education.
PUB DATE Jun 79
NOTE 27p.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Communicative Competence (Languages); *Curriculum Design; *Curriculum Development; *English (Second Language); *English for Special Purposes; Language Instruction; *Media Selection; Modern Language Curriculum; Postsecondary Education; Relevance (Education); Second Language Learning; Technical Education

ABSTRACT

This curriculum for technical students aims at linking the identity of the learner, his initial linguistic and technical competence, and his expectations with the competence expected of him on entering the technical college. The materials of the curriculum make use of a wide variety of information and data sources such as school-level science texts, consumer information, do-it-yourself manuals, government and public service publications, and commercial brochures. In each of the fourteen units, the students must actually solve technical problems using English, rather than answer questions about the use of English. As a unit progresses, the activities become more complex: students must re-apply and extend the knowledge and ability learned in previous sections. The course and materials are designed to develop the learner's capacity for communication in a technical context. Student evaluation is carried on by the students themselves through the activities undertaken. Summative teacher evaluations are written at the end of course. (PMJ)

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An English Language Curriculum

for Technical Students

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FL019984

Tom Hutchinson
Alan Waters
Michael P. Breen

Lancaster
June 1979

Practical Papers in English Language Education, Volume 2.
Institute for English Language Education

AN ENGLISH LANGUAGE CURRICULUM FOR TECHNICAL STUDENTS

A logical starting point in the design of any English Language curriculum is an identification of the learners, their likely contributions, and their needs. Traditionally, however, 'needs analysis' has tended to emphasise teaching concerns at the expense of learner contributions, and, on the rare occasions when note has been made of the latter, to assume they are static and of finite proportions. We have regarded it as important, therefore, to identify and give priority to what the learner brings to the teaching-learning process in the form of his initial competence, and also to take into account the likelihood that his expectations may not remain constant or be completely open to predetermination.

Our procedure, thus, has been to base the starting point of our design on the identity of the learner, his initial competence and his expectations.[1] Section A below illustrates these considerations with particular reference to the English language curriculum. Section B then looks at how this same procedure is carried over into an examination of the student's technical course, by considering what he brings, or, rather, is expected to bring, to his specific course of technical study. In effect, we have tried to identify in terms of what the learners bring to the learning-teaching process both the starting point for the English language teaching course - the student's initial competence and expectations - and the finishing point - the competence expected of the student on entering the technical college. The curriculum we have devised is aimed at linking the two points. Section C looks at the methodology and materials we use to achieve this aim. Finally, in Section D we consider evaluation in and of the curriculum.

A. LEARNER CONTRIBUTIONS.

A.1 Identity.

Groups of 12 male, post-secondary students from the Middle East. As intending engineering technicians, they have come to Britain for specialist training at various Technical Colleges. Prior to such training, they are required to undergo a six month full-time programme at Lancaster, aimed at ensuring they are adequately prepared for the demands of the subsequent period of specialist study. While at Lancaster, the students are resident with British families.

A.2 Learners' Initial Competence.

(i) Knowledge: a) Linguistic

For most students, their knowledge of English is that of a five year secondary school general English curriculum in their own country. In practical terms, this means they are beginners. A few have a more developed knowledge deriving from friendships with native-speakers of English in their home country.

b) Technical

In academic terms, equivalent to British 'O' Level standard, that is, the knowledge attained by the end of the fourth year of secondary school. In addition, most of them have some basic practical knowledge of car mechanics, and possibly also radio engineering.

(ii) Abilities and Skills:

The ability to interpret, express and negotiate in the Mother Tongue can be assumed. However, the learners are unable or reluctant to transfer these abilities - or see their relevance - to the English Language classroom.

Again, it is probable that there is competent skills realisation in the Mother Tongue, although variation in literacy skills no doubt exists. In English, there is an

apparent skills realisation present in listening and reading, but this is not apparent in speaking and writing. There are also significant problems in the reading and writing of English graphology. An area of particular weakness is in diagrammatic skills - e.g. diagrams, symbols, charts and all visuals. A few students have received training in technical drawing, but even these students show little evidence of having internalised the fundamental principles and techniques of drawing. This is evident in their inability to make adequate sketches.

A.2 Learner Expectations.

(i) Concerning English:

English is seen by them as a means of furthering their central concern for technical knowledge.

(ii) Concerning Language Learning:

The learners are strongly dependent on the teacher and are predisposed towards a 'formal' learning environment as a result of their previous educational experience. They are unused to working in peer groups or taking responsibility for their learning.

(iii) Learner Needs, Interests and Motivation:

Initially, the learners perceive and define their needs in terms of obtaining technical qualifications. Interests in everyday social life (girls, entertainment, travel etc.) and classroom life, lead to the learners' recognition of further needs. Their main motivation is instrumental, and this remains constant throughout their English Language course.

The learners' contributions to the curriculum, as revealed by this analysis, have several obvious implications for the designer:

(a) the overriding interest of the learners in technical matters should be exploited as a means of maintaining their interest during the teaching-learning process itself;

(b) the learner's communicative competence in the Mother Tongue can be brought to bear on the task of communicating in English and metacommunicating about English;

(c) but, the students' predisposition for teacher-led classroom learning requires the curriculum to sensitise them to alternative learning methods in order to realise (b).

How these points are translated into curriculum design decisions emerges in the ensuing sections of this paper.

B. ANALYSIS OF THE TARGET SITUATION

In recent years, it has become standard practice in the construction of a specialised curriculum to conduct an analysis of the situation for which the curriculum is preparing the learners. Unfortunately, the aspects of the situation which are usually given greatest prominence by such analyses tend to be merely 'surface' or 'performance' features. A glance at a mechanical engineering class in a Technical College for example, will reveal that the topic is concerned with mechanical engineering, that there are texts about mechanical engineering under consideration and so on; but what the students are expected to cope with should not be confused with what the students require in order to cope. A distinction needs to be drawn between the end - in this example, understanding a lesson on a Mechanical Engineering topic - and the means. It is necessary to examine the underlying competence which the learner must bring to the mechanical engineering classroom, or to the study of any specialised subject. Performance - or target language repertoire - has importance in what it reveals to the designer about the means of communication in the specialisation. The specialist subject teacher,

however, will have certain assumptions concerning his audience in terms of their previous knowledge, shared frames of reference, abilities and so on, and he will embed the teaching of his specialisation in that assumed competence and expect the learners to be able to exploit such a competence. It is possession of this assumed competence which enables the student to comprehend and retain the information that the teacher presents. The assumed competence, in other words, is the means.

The analysis of the target situation, then, should begin by distinguishing the Target Performance Repertoire from the Underlying Target Competence. Each of these areas should then be examined. What follows is an illustration of this approach, with reference to the target situation into which our Technical students go - the classroom of the British Technical College.

B.1 Distinguishing Target Repertoire from Underlying Target Competence:

The learners' ability to interpret and express the discourse of engineering as it occurs in the British Technical College does not derive from or depend on having previously acquired a repertoire of specialist engineering language and knowledge. The ability-use demanded of the learner in the target situation centres on the interpretation and expression of everyday language to comment upon technical content (e.g. machinery, diagrams, etc). Similarly, the conceptual, notional or ideational knowledge assumed is non-specialist and equivalent to the 'general' areas of knowledge acquired by a native-speaker by virtue of his British education and up-bringing.

B.2 The Specific Target Performance Repertoire:[2]

Communication in the Technical College situation is predominantly visual and oral - the visual is the focus of the meaning, whilst the oral serves to direct attention to and to commentate upon the visual. Cohesion between

the visual display and the oral commentary is produced by paralanguage (pointing, gaze direction, etc.) There are also patterns of oral negotiation between the teacher and the learners.

Technical information and knowledge is presented through an assumed shared awareness of everyday popular technology (e.g. how a car works, domestic appliances etc.), British socio-cultural frames of reference (e.g. politics, mass media, history etc.) and by the development of meanings originally drawn from a non-technical context (e.g. 'Drum' = musical instrument ⟶ part of a winch, a brake etc). Such analogical methods of presentation are integral to the teacher's attempts to increase the learners' understanding and memory of the technical knowledge. They operate on the simple principle of proceeding from the known - i.e. non-specialised knowledge and language - to the unknown - i.e. the new, specialised knowledge.

B.3 The Specific Underlying Target Competence:

The learners' communication within a specialist technical course involves the development and use of knowledge, abilities and skills which can be regarded as common to those underlying most other scientific and technical subjects. We can assume, therefore, that there is likely to be more overlap in demands on learner competence across such subjects than there is distinctiveness in such demands. If this were not the case, how would native speakers, all from more or less the same educational and cultural background, cope with the different specialisms of further education?

C. METHODOLOGY AND MATERIALS DESIGN

C.1 Content Selection:

On the basis of student interest and motivation, the focus is mainly on technical content, regardless of the language in which it is expressed or interpreted. Learners make use of information and data sources of a wide variety

- e.g. school-level science, consumer information, do-it-yourself manuals, publications of national Government and public services, of various manufacturers etc. Account is also taken of other interests which develop as the curriculum progresses (see A.3 (iii)), and content related to those areas included as well.

C.2 Content Organisation:

The subject matter is divided into 14 units - each divided into several Sections, and each Section involving approximately two hours teaching-learning. Each Unit is topic-based - e.g. "Metals", "Heat", "Electricity", "Meteorology", "Pumps"[3] etc. The materials within each Unit are designed to present the students with simple technical problems which they must solve by using English - rather than designed as tasks about the use of English. As a particular Unit progresses, the activities become more complex, building up a body of 'core' knowledge and abilities. This increasing complexity is made possible by the topic-basis of the Unit: each new Section is not weighed down by new information, but rather calls upon the students to re-apply and extend the knowledge and ability-use learnt in previous Sections. The final task in each Unit is a learner presentation involving refined and related knowledge and abilities, e.g. the description of a process, the reporting of an experiment or a survey, the formulating of a policy, etc.

Throughout the course content is selected and organised with a view to serving the teaching-learning process and developing the learners' knowledge and abilities. In other words, the course and materials are designed to develop the learners' capacity for communication in a technical context, rather than to teach the use of a specific corpus of technical language.

C.3 Teaching-Learning Process:

(i) Classroom Procedure:

Pair- and group-work is used extensively in order to create opportunities for communcation about and within the activity. Communication in the classroom serves as a means to the sharing and solving the various problems proposed within the materials. (Thus, the language used during classroom activities functions as a means to other ends).

(ii) Exploitation of Learner Abilities:

The emphasis throughout is upon individual and group interpretation of information from a variety of sources - e.g. text, film, diagram, picture, etc. - the expression and negotiation of different interpretations, and the expression of an agreed solution to particular problems posed. This cycle of ability-use typically leads on to learner-initiated cycles of similar kinds.

(iii) Exploitation of Learner Skills:

Equal use is made of oral, visual and written modes throughout the course and within the materials. Therefore, students are involved in the use and refinement of the various skills in relation to one another and in terms of appropriate cycles - e.g. read a text, read or construct a diagram, label the diagram or make notes, write up individual or group report, and give an illustrated oral presentation.

D. EVALUATION PROCEDURES

(i) Evaluation of Learner Progress:

Emphasis is placed on formative or on-going evaluation of learner progress. Such evaluation is primarily carried out by the students themselves through the various activities undertaken, and more explicitly through particular activities which focus on the evaluation process itself.[4] There is also formative and summative - or end-of-course -

evaluation of learner progress by the teachers. Both kinds of evaluation adopt the same format as that used for other activities which the learners undertake.[5]

(ii) Evaluation of the Curriculum:

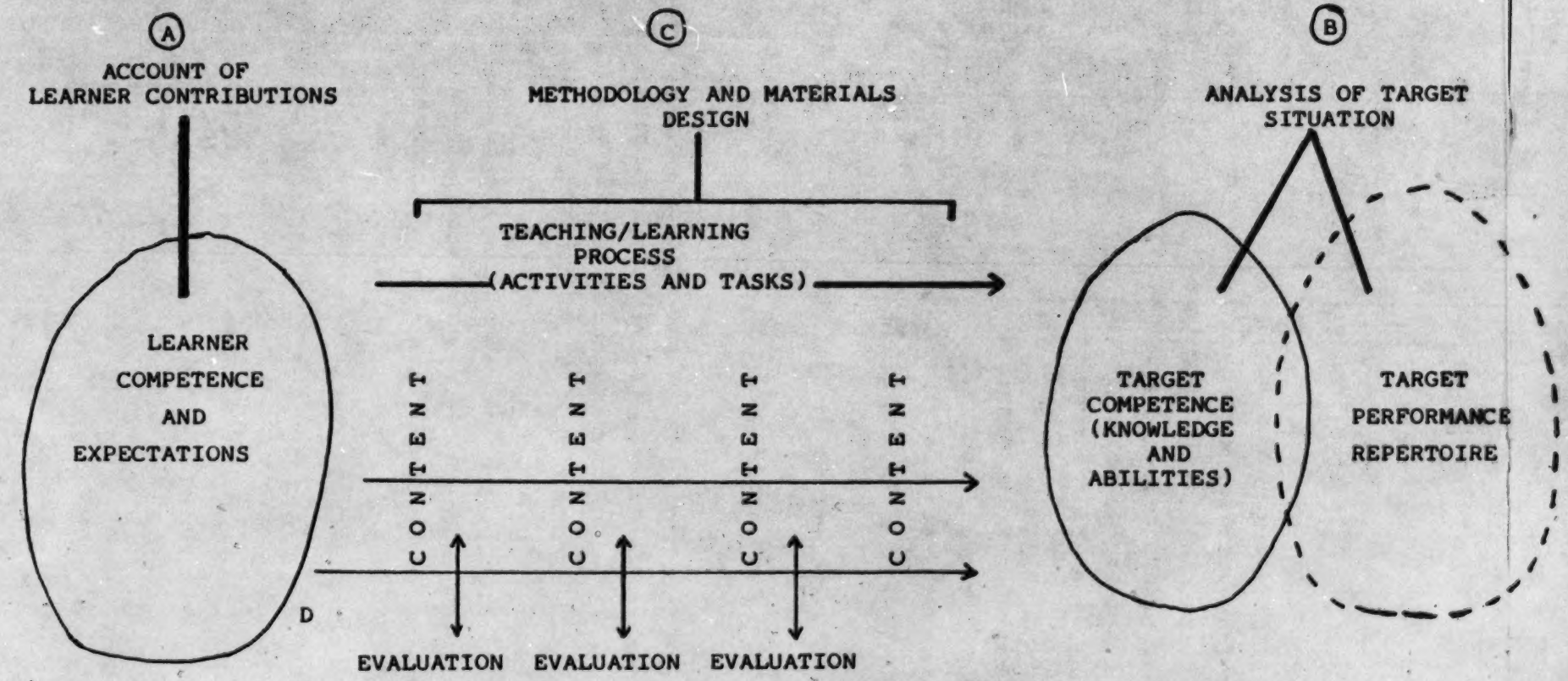
The learners meet with the teachers once a month for a formal discussion on all aspects of the particular curriculum. Informal discussion of the purposes, contents, and teaching-learning process occurs at theindividual student's or the group's request.

The teachers meet formally once a week for on-going evaluation of the curriculum. There is also on-going evaluation of the materials used by means of detailed written records - close reference is made to the qualities or drawbacks of the materials in relation to the rest of the curriculum, and specific recommendations are sought for improvements.

CONCLUSION

The relationship between the aspects of the curriculum considered above - Learner Contributions, Analysis of the Target Situation, Methodology and Materials and Evaluation - is summarised in the diagram. As can be seen, the curriculum seeks to build a bridge between the learner's initial competence, and the target competence. The success of the exercise clearly depends on the analysis of these two levels of competence being accurate, and on continual evaluation of the curriculum. However, we feel that this focus on what the learner brings to the teaching-learning process is the soundest basis on which to construct the English Language curriculum.

Future developments of major significance are likely to centre on creating far more provision in the curriculum than already exists for Units of activities which sensitise the learner to the nature of learning, and



Aspects of the Curriculum Design - A Summary

language learning in particular. At present, students are sensitised to the use and development of effective strategies for working in small groups in the manner described by Buckley, Bruton and Samuda (1978). However, it is now recognised that the gap between the learner's perception of his responsibilities in the learning-teaching process and the demands made on him by the curriculum in the achievement of longer term purposes is such that there should be a much greater orientation towards effective learning behaviour included in the earliest part of the curriculum.

We hope to present our development of this aspect of the curriculum as the subject of a future paper.

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APPENDIX

Note

The items in this Appendix can be viewed as examples of materials relating to particular aspects of the curriculum, as already indicated. They can also be seen as an example of a 'natural' study cycle, emerging, in part, from needs generated by the first item in the sequence. From this angle, the material on pages 3 - 7 should be read subsequently to that in pages 8 and 9: the 'Test' was used originally as a summative evaluation of student ability as learned in the context of the whole of the 'Pumps' Unit,[6] and the 'Homework' Unit designed, in part, as a follow up to feed-back obtained from the 'Test' results.

Unit: Pumps.

Section E: Group Work - Pump Mechanisms.

Work in groups of 3 or 4.

Step 1: Each member of the group has a picture of a certain type of pump. Study your picture carefully.

Step 2: In your group, discuss:-
- what components the pump consists of
- how it works
- what advantages and disadvantages it has
- what sort of jobs it might be used for

Step 3: Draw a large-scale diagram of the pump. Label it and use arrows to show the flow of the fluid and the direction of the moving parts.

Step 4: Prepare a report, describing the pump. Consider all the points you discussed in Step 2 and put this information in your report.

Step 5: Using the diagram you have prepared, present your report to the class.

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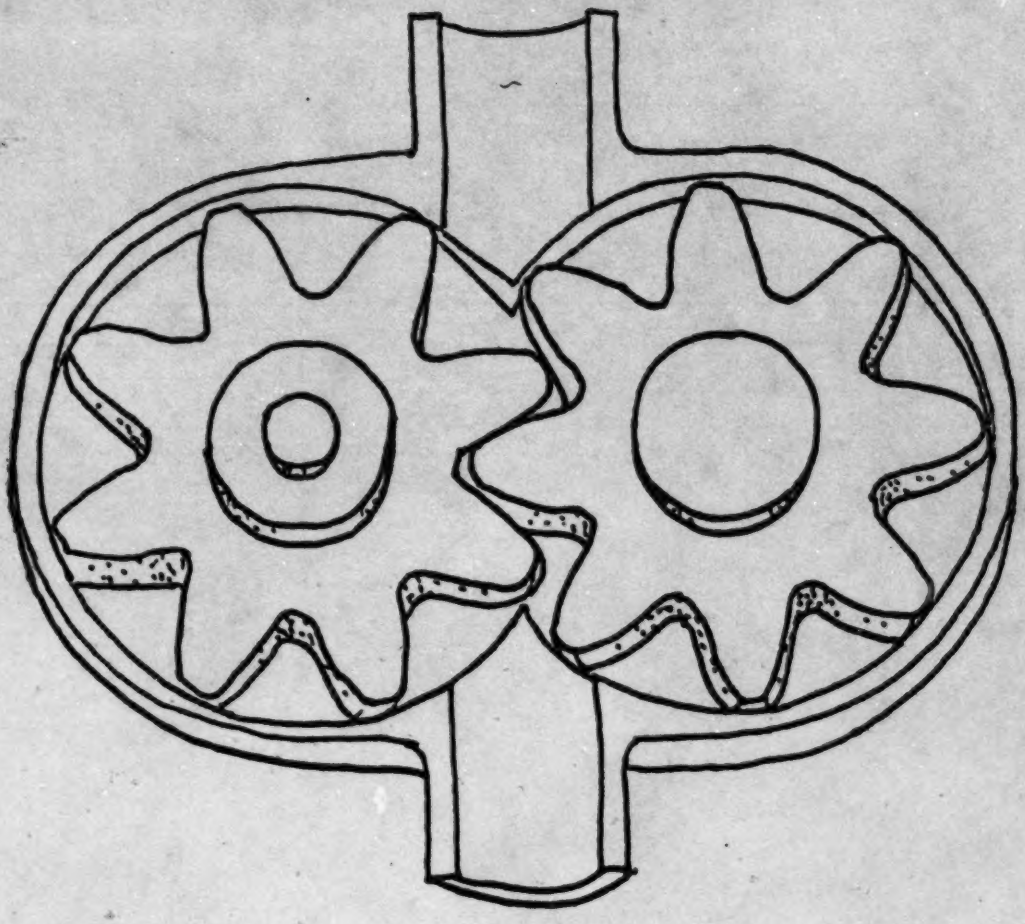

Note: each group receives a diagram of a different kind of pump. This is just one example.

PB/MB/STUDY SKILLS(TECHNICAL ENGLISH) STUDENT WORKSHEET

UNIT : HOMEWORK

STEP 1: Work in groups. Discuss these questions:

(i) Why do we give you homework?

(ii) Do you learn anything by doing homework?

(iii) Why do we give you a mark for your homework?

STEP 2: Work in groups. Look at the examples of homework below. In the first, the teacher has fully corrected what is wrong, and in the second he has only drawn symbols and lines. From which homework do you think student will learn most? Why?

1) ~~How is the Metal eactract~~? The Extraction of Metals

Iron is melted in a blast furnace. The eactraction process needs four ingredients: iron ore, coke ~~for~~ to produce the heat, air ~~for~~ to increase heat, and limestone ~~for~~ to absorb the impurities in the ore.

Crushed iron ore is misced with coke and limestone. This mixture is ~~be~~ taken in a skip up a ramp ~~for~~ to the top of the furnace and poured in. Hot air is ~~blas~~ blasted into the base of the fire to produce the high temperatures needed.

Write on horizontal line.

Very poor, Rashki. Too many careless mistakes.

continued.....

2) How is the Metal extract? !! Not good enough, Rasit!! 165

Iron is melted in blast furnace. The extract process need four ingredients, iron ore, coke for produce the heat, air for increase heat, and limestone for absorb the impurities in the ore. Crushed iron ore is mix to coke and limestone. this mixture is be taken in a skip up a ramp for the top of furnace and pouring in. hot air is blast into base of the fire to producing the heights temperatures needing. → seasick?!

!! !

STEP 3: Work in groups. Discuss these two questions:

(i) What do you normally do with your homework when the teacher gives it back to you? (Be honest!).

(ii) What do you think you should do with your homework when the teacher gives it back to you?

STEP 4: Work in groups. Think of all the comments a teacher might write on your homework. Make a list of these, dividing them into:

(i) Comments on layout.

(ii) Comments on content.

Show the different ways each comment might be written (remember symbols, initials and abbreviations from Note-taking).

STEP 5: Work in pairs. Look at the sample of homework the teacher will give you. You are now the teacher and you must mark the homework, using what you discussed in Step 4.

STEP 6: Work in pairs. Look at the sample of homework that another pair of students marked in Step 5. Now you are the student who has to understand the teacher's comments and then put them right.

When you have finished, make a list of the different things you have learnt by correcting this homework.

continued.....

Also make a brief report on what you think this student should be careful about in future.

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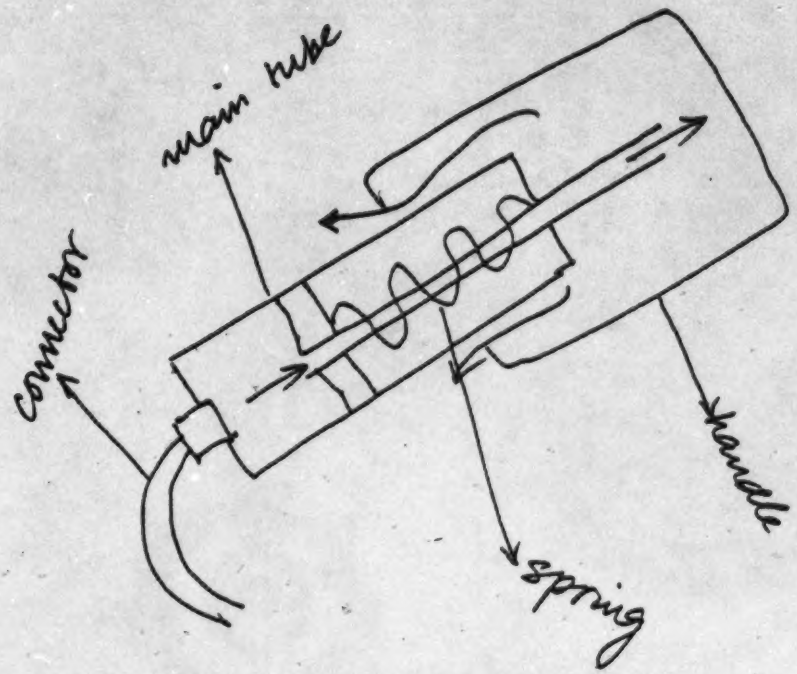
Study Skills
Unit: Homework
Step 5 14/5/79.

Adrian 167.

BYCICLE PUMP.

a, what is made of: As we all know this machine is consist of parts, Tube, handle spring, connector.



b: how works — first all these parts are made of material eg: plastic. metal. Afterwards air pushed through and into types for increasing pressure.

Unit: Homework
Step 5

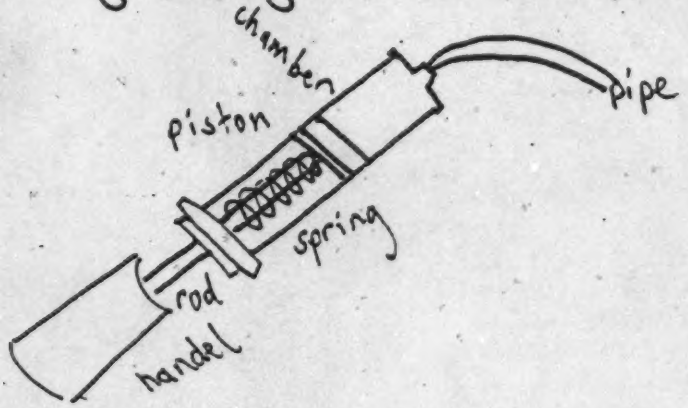
Rashti Smith (lovely boy)

79/5/14

Bicycle Pomp

(1) Parts:
What the object consist of:
The object consist of: piston - cylinder - pipe - spring - handel

(2) How it is working
when the handel is ~~relised~~ ~~sectised~~ release the piston move back, and it causes which suply the air in the sylinder, Because the piston is made of plastic and then the air can be entered the cylindre
The pressure in the back of cylinder is high but in front of the it is low.



what is made of? (Every Part) Why?
the handle and the sylinde made of plastic and the piston made of aluminium because is light metal

Sorry finish the time

TEST

Step 1: Read all the instructions.

Step 2: Your group has an object to study. As a group, you have ten minutes to prepare the information you will need for answering Step 3. Use English only.

Step 3: On your own, write a report describing the object. Your report should include

- what the object consists of
- how it works
- what its parts are made of, and why
- any other important aspects

Illustrate your report with appropriate sketches. You have twenty minutes to complete this Step.

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ASSESSMENT SHEET

1. re. Step 2

		APPROPRIATE*										INAPPROPRIATE**
		10	9	8	7	6	5	4	3	2	1	0
Group 1	Kourosh											
	Mohsen											
	Massood											
	Nader M											
Group 2	Majid											
	Rez											
	Alborz											
	Kembiz											
Group 3	Hossein											
	Shahrokh											
	Abolfazl											
	Bahram											
Group 4	Abbass											
	Mustafa											
	Ali R.T.H											
	Cyrus											
Group 5	Nader A											
	Ali R.D											
	Bizan											
	Gholam											

* e.g. sizes up, initiates, evaluates, is co-operative, considerate, flexible, generally contributes to and makes use of the resources of the group well.

** e.g. leaps before looking or shows 'tunnel vision', ignores others, generally fails to contribute to or make use of the resources of the group in any significant way.

2. re. Step 3

Mark out of 15, taking into account

- quality and usefulness of sketches
- ordering of events
- lay-out
- information
- punctuation, handwriting, paragraphing
- vocabulary and grammar
- etc.

NOTES

1. For a detailed study of the importance of learner contributions to the curriculum see M. P. Breen and C. N. Candlin, 'The Communicative Curriculum in Language Teaching', Longman (forthcoming).

2. For a more detailed account see Hutchinson (1978) and Hutchinson and Waters (1979).

3. See Appendix (pages 1 - 2a) for example of Materials used as a Section of a particular Unit.

4. For an example of an activity which seeks to explicitly involve the students in the evaluation of their own learning, see materials (by P. Buckley) in Appendix (Unit: 'Homework', pages 3-7).

5. See Appendix (pages 8-9) for 'Test' and 'Assessment Sheet', as an example of a summative evaluation.

6. The 'object' was, in this case, a bicycle pump.